

Worksheet 3.1 Special Pairs of Angles

Classify each of the statements as true or false.

1. If two angles are complementary and congruent, each has a measure of 45° . *true*
2. If two angles are congruent and supplementary, then each is a right angle. *true*
3. Perpendicular lines form four right angles. *true*
4. Two vertical angles may be complementary. *true*
5. If $m\angle 1 = 20$, $m\angle 2 = 40$, and $m\angle 3 = 50$, then the three angles are complementary. *false*

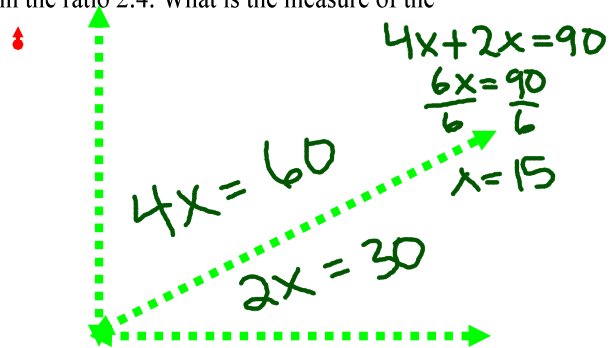
Find the measure of a complement and a supplement of $\angle A$.

6. $m\angle A = 20$
C *70*
S *160*

7. $m\angle A = 75$
15
105

8. $m\angle A = 89$
1
91

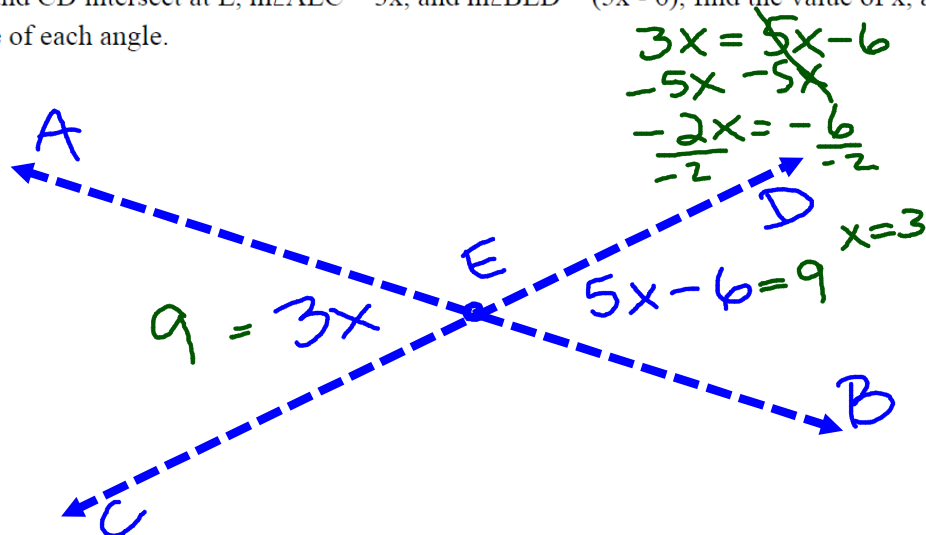
9. Two complementary angles have measures in the ratio 2:4. What is the measure of the larger angle?



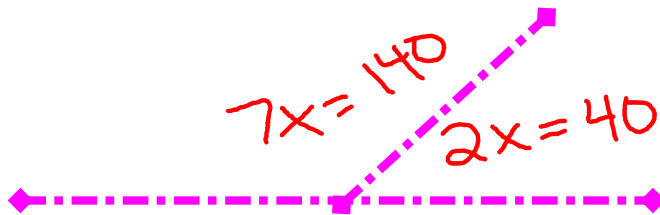
10. Two congruent angles are complementary. What is the measure of each angle?

45

11. If \overleftrightarrow{AB} and \overleftrightarrow{CD} intersect at E, $m\angle AEC = 3x$, and $m\angle BED = (5x - 6)$, find the value of x , and the measure of each angle.

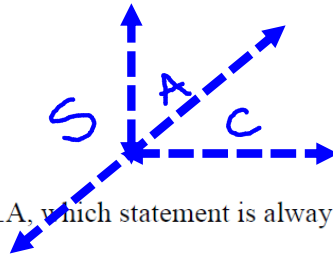


12. The measure of two supplementary angles are in the ratio 2:7. Find the measure of the *smaller* angle.



$$9x = 180$$

$$x = 20$$



13. If $\angle C$ is the complement of $\angle A$, and $\angle S$ is the supplement of $\angle A$, which statement is always true?

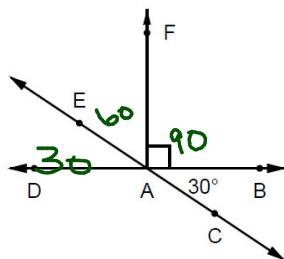
(a) $m\angle C > m\angle S$

(b) $m\angle C + m\angle S = 90$

(c) $m\angle C + m\angle S = 180$

(d) $m\angle C < m\angle S$

In the diagram below, \overleftrightarrow{DB} and \overleftrightarrow{EC} intersect at A. $\overrightarrow{AF} \perp \overleftrightarrow{DB}$, and $m\angle BAC = 30^\circ$.



14. Find the measure of $\angle EAD$.

30

15. Find the measure of $\angle FAC$.

120

16. $\angle DAE$ and $\angle EAF$ may be classified as what kind of special angles?

adjacent, complementary, or acute

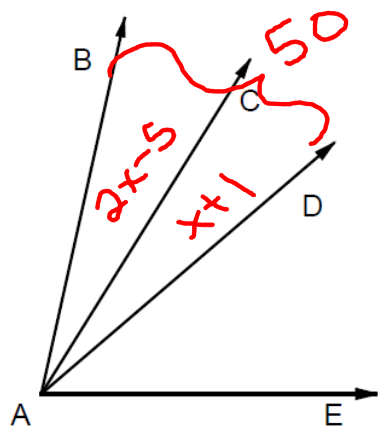
17. What is the sum of $m\angle DAE$ and $m\angle EAB$?

180

18. Find the measure of $\angle BAE$.

150

Questions 19 - 22 refer to the following.



$$3x - 4 = 50$$

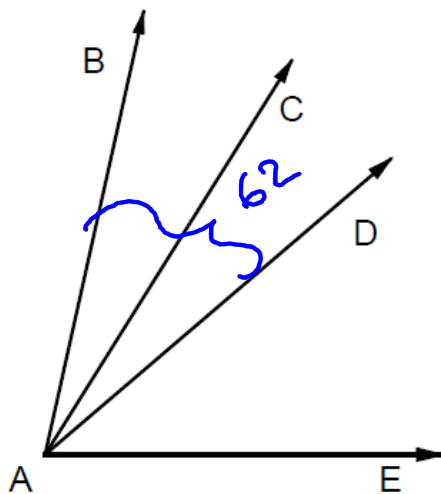
$$+4 \quad +4$$

$$3x = 54$$

$$\frac{3x}{3} = \frac{54}{3}$$

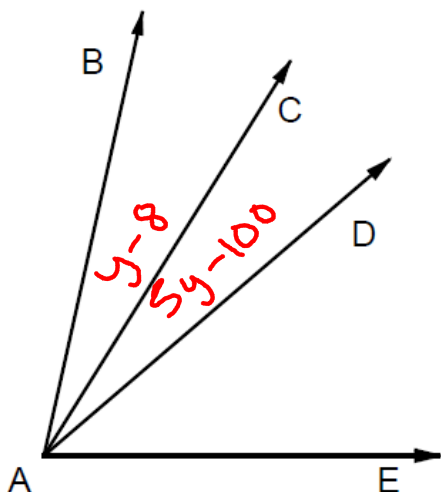
$$x = 18$$

19. If $m\angle BAC = (2x - 5)$, $m\angle CAD = (x + 1)$, and $m\angle BAD = 50$, find the value of x .



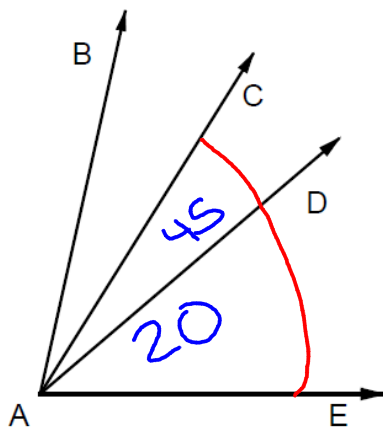
$$\frac{62}{2} = 31$$

20. If \overrightarrow{AC} bisects $\angle BAD$ and $m\angle BAD = 62$, find $m\angle BAC$.



21. If \overrightarrow{AC} bisects $\angle BAD$, $m\angle BAC = (y - 8)$, and $m\angle CAD = (5y - 100)$, find the value of y .

$$\begin{aligned}
 y - 8 &= 5y - 100 \\
 +100 &\quad +100 \\
 y + 92 &= 5y \\
 -y &\quad -y \\
 92 &= 4y \\
 \frac{92}{4} &= \frac{4y}{4} \\
 y &= 23
 \end{aligned}$$



22. If $m\angle EAD = 20$ and $m\angle DAC = 45$, find $m\angle EAC$.

$$65$$